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ABSTRACT

This study examined the effectiveness of the State University of New York's (SUNY) energy conservation program which involves monitoring campus utility budgets and promoting energy awareness. The study proceeded primarily through a review of 112 energy audits that were conducted at SUNY campuses in 1989 and 1990 and analysis of energy consumption at SUNY's State-operated campuses over a 10-year period. In addition, the study investigators reviewed selected records, visited seven colleges and universities, and interviewed officials at SUNY Central Administration. The researchers found that if recommendations made by the energy audits were implemented, campus energy costs could be reduced by at least $4.6 million annually. However, they also found that no action had been taken by SUNY to address any of the energy audit recommendations. Other findings were: (1) that consumption was particularly high at three campuses where consumption was between 123 and 335 percent more per square foot that other campuses and that these campuses together accounted for more than 27 percent of SUNY's total energy costs during the year ending March 31, 1990; and (2) that campuses with higher rates of energy consumption received far less in conservation funding than campuses with lower consumption. Appendixes list report contributors, and contain the response of SUNY officials to the report recommendations and the State Comptroller's notes to SUNY's response. (JB)

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State of New York
Office of the State Comptroller
Division of Management Audit

STATE UNIVERSITY OF NEW YORK

STAFF STUDY REGARDING THE EFFECTIVENESS OF THE UNIVERSITY'S ENERGY CONSERVATION PROGRAM

REPORT 93-D-5

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State of New York
Office of the State Comptroller

Division of Management Audit

Report 93-D-5

The Honorable D. Bruce Johnstone
Chancellor
State University of New York
State University Plaza
Albany, NY 12246

Dear Chancellor Johnstone:

The following is our staff study regarding the effectiveness of the University's Energy Conservation Program.

This staff study was performed pursuant to the State Comptroller's authority as set forth in Section 1, Article V of the State Constitution and Section 8, Article 2 of the State Finance Law.

This report was prepared under the direction of John T. Walsh, Audit Director.

Major contributors to this report are listed in Appendix A.

Office of the State Comptroller
Division of Management Audit

December 15, 1992

Executive Summary

State University of New York -- Staff Study Regarding the Effectiveness of the University's Energy Conservation Program

The State University of New York (SUNY) Central Administration coordinates and administers an Energy Conservation Program for 29 State-operated colleges and universities. The Program, administered primarily by one individual, involves monitoring campus utility budgets and promoting energy awareness. For the year ended March 31, 1990, SUNY's energy costs totaled about $103 million.

Our study addressed the following questions about SUNY's Energy Conservation Program:

- Has SUNY complied with State Energy Office lighting standards designed to reduce energy consumption?

- How effective is SUNY in implementing energy-saving improvements?

- How effective is SUNY in ensuring that the campuses heat and light their buildings as efficiently and economically as possible?

Observations and Conclusions of Study

In the early 1970s, SUNY was active in reducing energy consumption at its campuses. However, we found that over the last ten years SUNY's energy conservation efforts have slackened. Though a number of campuses made continuing progress in reducing energy consumption during the 1980s, SUNY's progress as a whole was hindered by some campuses with serious energy consumption problems, largely because SUNY Central Administration did not provide the oversight necessary to effect meaningful and lasting changes. We believe that with better management, SUNY's energy efficiency could improve significantly.

In accordance with the State Energy Law, in 1980 the State Energy Office published standards that were designed to reduce unnecessary lighting in public buildings. By complying with these standards, SUNY could have reduced its energy consumption significantly during the 1980s. However, as late as April 1, 1991, 29 percent of SUNY's eligible buildings still failed to meet these standards. As a result, since 1981 these buildings have incurred at least $15.7 million in unnecessary electrical costs. We estimate that about $1.7 million a

year in such costs will continue to be incurred until the lighting standards are met in all SUNY buildings. (see pp 4-5)

Utility companies in New York State can examine a building and identify low-cost measures that will improve the building's energy efficiency. According to the State Energy Office, a building's energy consumption can be reduced by 10 to 15 percent if the recommendations made by these energy audits are implemented. We reviewed 112 energy audits that were conducted at SUNY campuses in 1989 and 1990. We determined that, if the recommendations made by these audits were implemented, campus energy costs could be reduced by at least $4.6 million annually and the cost of implementing these recommendations could be recovered in less than one year. However, as of May 1991, no action had been taken by SUNY to address any of the recommendations made by the 112 energy audits. (see pp 5-7)

We analyzed energy consumption at SUNY's State-operated campuses over a ten-year period and identified three campuses where consumption was especially high: the Stony Brook Health Science Center, the Brooklyn Health Science Center, and the Stony Brook West campus. On average, these three campuses consumed between 123 and 335 percent more energy per square foot than the other SUNY campuses during the period, and together accounted for more than 27 percent of SUNY's total energy costs during the year ended March 31, 1990. We identified several possible reasons for the high rate of energy consumption at these three campuses, including a long delay in establishing a formal energy conservation program on campus, widespread noncompliance with the State Energy Office's lighting standards, and poor preventive maintenance procedures. (see pp 8-10)

We also identified other improvements that were needed in SUNY's efforts to ensure that its campuses were heated and lit as efficiently as possible. For example, the allocation of energy conservation funds to the campuses did not appear to be based on need, as campuses with higher rates of energy consumption received far less funding per square foot than campuses with lower rates of energy consumption. We also noted that many campuses lacked up-to-date automated energy management systems and had not developed adequate plans for reducing their energy consumption. (see pp 10-13)

Response of SUNY Officials to Study

SUNY officials agree with some of our recommendations to enhance energy conservation but disagree with our methodology for measuring the success of their energy conservation program. (See Appendix B)

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Introduction

Background

In the early 1970s an energy crisis precipitated a campaign in which energy users sought ways to reduce energy consumption. To meet this challenge, the State University of New York (SUNY) implemented certain improvements. For example, SUNY reduced lighting, insulated buildings and installed energy management systems to monitor building temperatures and control heating, ventilating and air conditioning fans.

During the fiscal year ended March 31, 1990, SUNY spent more than $103 million for energy.

Between the late 1970s and the early 1980s energy costs rose dramatically, doubling SUNY's costs of $51 million in 1978 to over $102 million in 1982 for the same level of consumption. Since then, energy prices have fluctuated and SUNY's consumption has risen slightly, with SUNY's costs averaging over $100 million annually. During the fiscal year ended March 31, 1990, SUNY spent more than $103 million for energy including electricity ($68.5 million), natural gas ($13.9 million), fuel oil ($11 million), purchased steam ($8.1 million), and miscellaneous energy ($1.7 million). Three of SUNY's 29 colleges and universities accounted for almost half of the expenditures: the University of Stony Brook (23 percent), the University of Buffalo (12.7 percent), and the statutory colleges at Cornell University (10.4 percent).

The 1980s witnessed many technological innovations that have made it possible for consumers to improve their energy efficiency. Examples of such innovations include improved lighting fixtures that provide enhanced lighting as well as increased efficiency, more efficient appliances and motors, and advanced computerized energy management systems that can better control building environments and heating, ventilating and air conditioning equipment.

Two methods available for conducting energy evaluations to assess energy efficiency and identify cost-effective measures of improving energy efficiency are the energy audit and the technical assistance study. An energy audit is an on-site survey of a building, generally performed by local utility companies, to identify low-cost operations and maintenance modifications that can reduce energy consumption. In the State Energy Office's experience, energy savings of between 10 and 15 percent can be achieved by carrying out such modifications. The technical assistance study is a more in-depth analysis, generally conducted by a licensed engineer or registered architect, to determine the cost-effectiveness of making further modifications and of

implementing higher-cost energy conservation measures for a building or group of buildings. Both types of energy evaluations have been conducted for SUNY.

The SUNY Energy Conservation Program is coordinated and administered by the Office of Facilities Management and Support Services (Facilities Management) within SUNY's Central Administration. The Program is administered primarily by one individual, who is responsible for monitoring campus utility budgets and promoting energy awareness. At the campuses, energy conservation activities are overseen and conducted by many individuals.

Scope, Objectives and Methodology of Study

We reviewed selected aspects of SUNY's Energy Conservation Program for the period April 1, 1989 through July 31, 1991. The objective of our study was to determine whether the Program was effective in reducing campus energy costs. To accomplish our objective, we evaluated Facilities Management's internal control structure and its compliance with applicable regulations related to energy consumption, its procedures for identifying and implementing cost-effective energy improvements, and its procedures for ensuring campuses heat and light their buildings as efficiently and economically as possible. We also reviewed selected SUNY records, visited seven colleges and universities, and interviewed officials at SUNY Central Administration, and most of the colleges and universities. In addition, we analyzed campus energy consumption for the ten-year period ended March 31, 1990.

Internal Control and Compliance Summary

Our consideration of SUNY's internal control structure identified material weaknesses in Facilities Management's procedures for identifying and implementing cost-effective energy improvements and for ensuring that campuses heat and light their buildings as efficiently and economically as possible. These weaknesses are further described in the sections of this report entitled "Millions of Dollars in Potential Savings Were Not Realized Due to SUNY's Inaction" and "SUNY's Management Oversight Needs To Be Improved." Our study also identified significant noncompliance with State Energy Office lighting standards, as described in the section of this report entitled "Millions of Dollars in Potential Savings Were Not Realized Due to SUNY's Inaction."

Response of SUNY Officials to Study

A draft copy of this report was provided to SUNY officials for their review and comment. Their comments have been considered in preparing this report and are included as Appendix B.

Within 90 days after final release of this report, as provided by Section 170 of the Executive Law, the Chancellor of the State University of New York shall report to the Governor, the State Comptroller and the leaders of the Legislature and fiscal committees, advising what steps were taken to implement the recommendations contained herein and where recommendations were not implemented, the reasons therefor.

Millions of Dollars in Potential Savings Were Not Realized Due to SUNY's Inaction

In 1980, the State Energy Office published standards designed to reduce unnecessary lighting in public buildings. In addition, between 1981 and 1991, many energy audits and technical assistance studies were conducted at SUNY campuses. By complying with the lighting standards and implementing the recommendations contained in the audits and studies, SUNY could have reduced its energy consumption significantly during the 1980s.

SUNY was slow to comply with the Energy Office lighting standards ... as a result, we estimate that at least $15.7 million in unnecessary lighting costs have been incurred.

We found that SUNY was slow to comply with the Energy Office lighting standards: as late as April 1, 1991, 29 percent of SUNY's eligible buildings still were not in compliance with the standards. As a result, we estimate that at least $15.7 million in unnecessary lighting costs have been incurred. Moreover, none of the energy audit recommendations at two of the three campuses we sampled have been implemented. We estimate that more than $2 million a year in unnecessary energy costs will continue to be incurred until SUNY meets the lighting standards and implements the energy audit recommendations.

SUNY Has Been Slow To Meet Lighting Standards

The 1978 State Energy Law directed the State Energy Office to develop and promulgate lighting standards to minimize the consumption of energy and to provide for more efficient use of the energy expended for lighting in public buildings. These standards include a procedure (the building lighting survey) to establish the amount of lighting power presently used in a building and the maximum amount that can be used to meet the standards. The standards were finalized by the Energy Office in September 1980.

We found that Facilities Management did not require SUNY campuses to comply with the lighting standards until January 1990, when Executive Order 132 was issued. This Order required State agencies to take various actions to reduce energy costs. Subsequent to the Order's issuance, the SUNY campuses conducted building lighting surveys. When we reviewed the surveys for 27 SUNY colleges and universities, we found that as of April 1, 1991, 170 (29 percent) of the campuses' 595 eligible buildings were not in compliance with the standards. Adopting a formula developed by the State Energy Office,

we calculated that for those 170 buildings, SUNY had paid at least $15.7 million in electrical costs that could have been avoided had the standards been met as of April 1, 1981. We noted that Stony Brook, SUNY's largest consumer of energy, reported that none of its buildings complied with the standards.

We also found indications that, prior to April 1, 1991, some avoidable lighting costs were incurred at the other 425 campus buildings. For example, only 2 (Farmingdale and Cornell's Geneva satellite campus) of the 27 colleges and universities reported they were substantially in compliance with the standards by 1983. In addition, officials from 2 of the 13 colleges and universities reportedly in substantial compliance at the time of the surveys (after January 1990) told us the buildings on their campuses were not brought into compliance until 1990-1991. However, due to a lack of complete information, we were not able to estimate how much avoidable lighting costs were incurred by the other 425 buildings before April 1, 1991.

Subsequent to submitting their lighting surveys to Facilities Management in April 1991, SUNY campuses brought an additional 38 buildings into compliance. However, as of May 31, 1991, 132 of the 595 buildings (22 percent) remained out of compliance, costing the State an estimated $1.7 million annually in unnecessary electrical costs.

Recommendation

1. Ensure that all SUNY buildings comply with the Energy Office lighting standards.

Energy-Saving Recommendations Were Not Implemented

According to SUNY records, between June 1, 1981 and July 31, 1991, 273 energy audits and 58 technical assistance studies were conducted at SUNY campuses. As of January 1990, the Governor's Executive Order 132 required that the evaluations be conducted for most State-owned buildings. Facilities Management is responsible for ensuring that these evaluations are performed. We believe that Facilities Management should also take an active role in identifying and implementing the most cost-effective energy improvements contained in the evaluations. Without such action being taken, the value of the evaluations as a management tool to save energy may be wasted.

Facilities Management does not know whether the required energy audits and technical assistance studies have been done and cannot act on recommendations which could save SUNY millions of dollars annually in energy costs.

We found that Facilities Management does not require SUNY schools to submit energy audits and technical assistance studies to its office for review and analysis. Consequently, Facilities Management does not know whether the required energy audits and technical assistance studies have been done and cannot act on recommendations which could save SUNY millions of dollars annually in energy costs.

In order to determine the extent to which these recommendations were implemented, we judgmentally selected 112 of the 273 energy audits for review. A total of 74 of these audits were done at either the Stony Brook West campus or Stony Brook Health Science Center between May and July of 1989, while 38 of the audits were done at the Farmingdale campus between December 1989 and December 1990.

For the 74 Stony Brook audits, we found that as of May 1991, neither Facilities Management nor Stony Brook officials had taken any action to address the recommendations contained in the reports. In fact, during our visit to the school in May 1991, Stony Brook officials could not even find 51 of the 74 reports when we requested to look at them. Ultimately, Facilities Management had to contact the utility company to obtain copies of the missing 51 reports. The remaining 23 reports were in the custody of an individual who was not involved in Stony Brook's Energy Conservation Program.

Our analysis of the 74 Stony Brook energy audits showed that, when added together, these audits identified over $4.5 million annually in potential estimated savings, of which about $1.1 million could be achieved at no cost. For example, recommendations were made to raise air conditioning temperatures, lower heating temperatures, and to reduce lighting use. The energy audit reports indicated that in many buildings, thermostat setpoints were at 72 degrees, six degrees lower than the Facilities Management energy conservation standard of 78 degrees for daytime temperature settings in air conditioned spaces. By not meeting such standards, Stony Brook has wasted a cost-free opportunity to achieve annual energy savings.

In addition, the energy audits identified another $2.9 million in potential annual savings that could be achieved with a one-time cost of $3.8 million. Together, these no-cost and low-cost improvements yield a payback period (the time needed for savings to cover the costs of improvement) of less than one year.

We also found that, as of May 1991, neither Facilities Management nor campus officials had addressed the 38 energy audits performed at Farmingdale. These audits identified $631,899 in potential annual

savings. The audits also estimated that about $625,000 of the savings could be achieved with an investment of only $408,000 (.65 payback years).

Recommendation

2. Develop a system to track the recommendations made in energy audit and technical assistance study reports to ensure campuses implement cost-effective recommendations.

SUNY's Management Oversight Needs To Be Improved

...stronger actions were needed by Facilities Management if SUNY's Energy Conservation Program was to be as effective as possible.

We identified several areas in which stronger actions were needed by Facilities Management if SUNY's Energy Conservation Program was to be as effective as possible. For example, closer oversight was needed for campuses with very high energy consumption, energy conservation funds could be allocated more effectively, energy management systems at certain campuses need to be upgraded, uncompleted energy audits and technical assistance studies need to be scheduled, and individual campuses must be made more accountable for their energy consumption.

Energy Consumption Was High at Certain Campuses

As shown by Exhibit A, we analyzed energy consumption for 29 of SUNY's colleges and universities for the ten-year period ended March 31, 1990. (Three of these 29 schools have more than one campus, so our analysis addressed a total of 32 different campuses.) Our analysis identified three campuses that had consistently high rates of consumption: the Stony Brook Health Science Center, the Brooklyn Health Science Center, and the Stony Brook West campus. At the other 29 campuses, the average rate of energy consumption during the period was 22.5 British Thermal Units per outside gross square feet per heating degree day (BTUs/OGSF/HDD). This average was exceeded by 335 percent by the Stony Brook Health Science Center (97.8 BTUs/OGSF/HDD), 251 percent by the Brooklyn Health Science Center (78.9 BTUs/OGSF/HDD), and 123 percent by the Stony Brook West campus (50.1 BTUs/OGSF/HDD). In addition, the consumption rates at the Stony Brook and Brooklyn Health Science Centers were two to three times as high as the consumption rate at SUNY's other health science center at Syracuse, and the Stony Brook West campus, a university center, had consumption rates at least twice as high as the other university centers at Albany, Binghamton and Buffalo.

We also found that neither the Stony Brook West nor the Brooklyn Health Science Center campus had made any lasting progress in reducing consumption since the onset of the energy crisis in the early 1970s. For example, during the fiscal year ended March 31, 1973, the Stony Brook West campus had a consumption rate of 50.17 BTUs/OGSF/HDD. Since the 1985-86 fiscal year, however, this rate has averaged 54.82 BTUs/OGSF/HDD. The Brooklyn Health Science Center had a consumption rate of 74.8 BTUs/OGSF/HDD during the

fiscal year ended March 31, 1973. Between fiscal years 1980-81 and 1989-90, Brooklyn's consumption rate grew steadily from 65.05 to 92.04 BTUs/OGSF/HDD.

Combined, the Stony Brook West, Stony Brook Health Science Center and the Brooklyn Health Science Center campuses accounted for over 27 percent of SUNY's total energy expenditures for the year ended March 31, 1990 ($28.1 of $103.2 million).

Our study identified several problems that may have caused higher than necessary rates of consumption at both of Stony Brook's campuses. For example, Stony Brook administration did not establish an energy conservation program until 1988. Campus officials told us the program was established in response to severe budget cuts, and that prior to that time, the campuses did not have programs to reduce their energy consumption.

A Facilities Management official told us that Stony Brook has had poor preventive maintenance procedures over the years, which contributed to inefficient energy utilization and premature breakdown of expensive equipment. Also, Stony Brook was the only school where all of the buildings did not comply with the Energy Office lighting standards as of May 31, 1991. We calculated that between April 1, 1981 and April 1, 1991, Stony Brook spent $7.32 million in unnecessary electrical costs by lighting all its eligible buildings in excess of the lighting standards, and at the time of our study was spending $825,000 annually for this excess lighting.

We also found that the money spent at the Stony Brook campuses on energy improvement projects did not provide lasting results. Despite the nearly $900,000 spent at the Stony Brook Health Science Center over the ten years ended March 31, 1990, the rate of consumption during this period increased by 17 percent. A much larger sum of $2.37 million was spent at the Stony Brook West campus; yet, its energy consumption rate increased over the same period by 30 percent.

We believe that Stony Brook's prolonged history of high energy consumption, and its lack of success in dealing with major opportunities to reduce consumption (as presented in the energy audits), make it necessary for Facilities Management to actively manage and monitor Stony Brook's energy conservation efforts. Facilities Management should also work closely with the Brooklyn Health Science Center, where energy consumption rates have been very high and continue to grow.

Both Facilities Management and Stony Brook officials have indicated that a concerted effort is being made to reduce Stony Brook's energy consumption. For example, a cogeneration plant is planned to be in operation by 1993. Campus officials expect that this facility will significantly reduce the campus' electrical costs. However, the cogeneration facility will not have any effect on Stony Brook's high consumption rates, which must be addressed.

Recommendation

3. Work with campuses that have consistently high energy consumption rates to develop an action plan to reduce consumption.

Energy Improvement Funding Appears Inconsistent With Campus Needs

Facilities Management is responsible for allocating funds to improve campus facilities. The campuses submit requests for funds, which Facilities Management uses to prepare annual budgets for capital spending. Good management practices would dictate that available funding be directed to areas where it is most needed.

However, we analyzed the funds expended by the campuses for energy conservation projects for the ten-year period ended March 31, 1990, and found that expenditures were not related to the levels of campus energy efficiency. For example, as shown in Exhibit A, energy consumption rates at the Stony Brook Health Science Center, Brooklyn Health Science Center and Stony Brook West campuses were the highest by far in the SUNY system. Yet, the expenditures for energy improvements at these three campuses were either among the lowest in the SUNY system (Brooklyn Health Science Center) or in the middle range.

Conversely, Facilities Management allocated campuses with better records of energy efficiency a greater share of energy improvement funds. For example, the three campuses that received the most energy improvement funds over the ten-year period (Geneseo, New Paltz and Oswego) ranked near the middle in energy consumption. These campuses received far more energy improvement funding per square foot (Geneseo with $1.92 per square foot, New Paltz with $1.71 per square foot, and Oswego with $1.32 per square foot) than the highest energy consumers (Brooklyn Health Science Center with $.08 per square foot, Stony Brook West campus with $.32 per square foot, and Stony Brook Health Science Center with $.50 per square foot).

Recommendation

4. Ensure energy improvement funds are directed to cost-effective projects at campuses that have problems with energy efficiency.

Many Campus Energy Management Systems Need To Be Upgraded

We examined SUNY's efforts to install electronic equipment for controlling the operation of campus heating, ventilation and air conditioning systems (HVACs). In the mid 1960s, newly invented energy management systems (EMS), using pneumatically controlled devices, enabled campus physical plant managers to monitor room temperatures and control the cycling (turning on and off) of HVAC fans. By 1984 the technology had advanced to allow managers to control the environments of a network of buildings, using a direct digital controlled microprocessor. According to a campus official responsible for plant operation, an upgraded EMS can increase the energy efficiency of a campus HVAC system by as much as 15 percent.

Although SUNY took the lead in implementing EMS technology in the 1970s and early 1980s, Facilities Management was not as active during the mid and late 1980s in encouraging the campuses to upgrade their systems. Our review of Facilities Management records showed that 14 campuses have older systems with more limited capability in controlling HVAC equipment. Three of the campuses with limited EMS capability are the SUNY system's greatest consumers of energy: the Stony Brook West campus, the Stony Brook Health Science Center, and the Brooklyn Health Science Center. Furthermore, the energy audit reports done at Stony Brook identified over $1 million in annual savings that could be achieved by controlling temperature setpoints. An updated EMS at Stony Brook would provide enhanced controls over such building environments.

Recommendation

5. Determine the feasibility of upgrading energy management systems at the campuses, and where feasible, do so.

Planning Could Be Improved

In January 1990 the Governor's Executive Order 132 directed each State agency to complete a technical assistance study and energy audit for certain buildings. These energy evaluations should be completed by the end of 1994. Agencies were further instructed to develop an annual energy conservation plan, the first of which was to be submitted to the State Energy Office by August 1, 1990. The plan was to include a schedule for completing, by the end of 1994, all energy audits and technical assistance studies, with reasonable progress to be made in each year. The plan was also to include long and short-term measurable goals and objectives for reducing energy consumption by campus.

We reviewed SUNY's energy conservation plan and found that, while the plan contained a list of energy evaluations that had been done, there was no indication of when SUNY planned to complete most of the remaining required energy evaluations. As of July 31, 1991, SUNY had yet to complete 695 energy audits and 139 technical assistance studies. To ensure that these evaluations are completed on time, Facilities Management should develop a schedule with an anticipated completion date for each evaluation.

We also reviewed the individual campus reports of measurable goals and objectives included in the overall energy conservation plan submitted by SUNY to the Energy Office and identified the following deficiencies:

- Four schools did not submit any report at all (Cornell, Potsdam, and the Syracuse and Brooklyn Health Science Centers);

- Seventeen schools submitted reports which did not include any goals for reducing consumption; instead, they only reported past actions taken to reduce consumption; and

- Of the eight schools which submitted goals for reducing consumption, only four included long-term goals.

We believe that unless measurable goals are established and monitored, SUNY will not be able to effectively control energy consumption at the campuses.

Recommendations

6. Develop a schedule to ensure all required energy audits and technical assistance studies are completed by the end of 1994.

7. Require the schools to establish short and long-term plans and measurable goals for reducing energy consumption.

State University of New York
Campus Rankings for Energy Consumption Rates
and Dollars Spent on Energy Improvements
April 1, 1980 through March 31, 1990

Campus	Average Annual Energy Consumption(1)	Energy Improvement Dollars Per Sq Ft	Campus Ranking For Consumption	Campus Ranking For Spending
ALFRED CERAMICS	13.63	$0.01	1	32
CANTON	16.43	0.40	2	15
UTICA-ROME	16.77	0.03	3	31
ALFRED TECH	18.33	0.17	4	23
MORRISVILLE	18.43	0.26	5	19
POTSDAM	18.70	0.73	6	6
DELHI	18.84	0.47	7	13
BROCKPORT	19.11	0.48	8	12
COBLESKILL	19.14	0.15	9	25
BUFFALO-NORTH	19.60	0.08	10	28
ONEONTA	19.84	0.16	11	24
CORTLAND	20.36	0.75	12	5
SYRACUSE FORESTRY	21.31	0.41	13	14
OSWEGO	21.45	1.32	14	3
MARITIME	21.70	0.51	15	10
BINGHAMTON	21.74	0.24	16	20
BUFFALO COLLEGE	21.79	0.39	17	16
NEW PALTZ	22.22	1.71	18	2
GENESEO	22.80	1.92	19	1
PLATTSBURGH	24.20	0.56	20	9
PURCHASE	24.37	0.05	21	30
ALBANY	24.64	0.60	22	8
CORNELL	25.32	0.11	23	26
BUFFALO-SOUTH	25.61	0.09	24	27
FREDONIA	26.55	0.23	25	21
FARMINGDALE	27.71	0.77	26	4
OLD WESTBURY	31.20	0.73	27	7
SYRACUSE HSC	32.76	0.19	28	22
GENEVA (CORNELL)	38.15	0.35	29	17
STONY BROOK WEST	50.11	0.32	30	18
BROOKLYN HSC	78.87	0.08	31	29
STONY BROOK HSC	97.79	0.50	32	11

NOTE: 1. Consumption is measured in British Thermal Units (BTUs) per outside gross square feet (OGSF) per heating degree day (HDD). A British Thermal Unit is the amount of heat needed to raise the temperature of one pound of water by one degree Fahrenheit. A heating degree day is a formula that attempts to equalize for differences in the outside temperature at different locations.

Exhibit A

Major Contributors to This Report

Marvin Loewy, Audit Manager
Karen Bogucki, Audit Supervisor
Marcia Petersen, Auditor-in-Charge
John Cooke, Staff Auditor
Ernest Romanofski, Staff Auditor
Dana Newhouse, Report Editor

Response of SUNY Officials

SUNY officials agree with some of our recommendations but take exception to our methodology for measuring the success of their energy conservation program. They also contend that in some cases, they have already made significant progress towards reducing energy consumption. We believe our methodology is reasonable and gives valid indications of the extent of effectiveness of SUNY's energy conservation program.

The full text of SUNY's response to our draft report is included on the following pages. Our notes of clarification are referenced in the margin of the response and are included as Appendix C.

State University of New York
State University Plaza
Albany, New York 12246
Office of the Senior Vice Chancellor
Division of Administrative Affairs

August 21, 1992

Mr. Roland M. Malan
Assistant Deputy Comptroller
Office of the State Comptroller
The State Office Building
Albany, New York 12236

Dear Mr. Malan:

In accordance with Section 170 of the Executive Law, we are enclosing the comments of State University of New York on the Staff Study Regarding the Effectiveness of the University's Energy Conservation Program, State University of New York (93-D-5).

Sincerely,

Harry K. Spindler
Senior Vice Chancellor
Division of Administrative Affairs

Enc.

State University of New York Comments

General Comments

The Office of Capital Facilities (OCF) has reviewed the State Comptroller's draft report on energy conservation and has prepared the following general comments and responses to each of the individual recommendations.

In general, the University has had a very successful energy conservation program, monitored by OCF since 1973/74. This energy conservation program has provided a cost avoidance of $437.8 million since 1973/74.

Energy consumption can be measured in units of energy used for each square foot of building space; specifically in British Thermal Units (BTU's) per Outside Gross Square Foot (OGSF). However, the auditors have selected a standard to measure the effectiveness of the University's energy conservation program based on energy use in British Thermal Units per square foot per Heating Degree Day (BTU's/OGSF/HDD). This standard by itself is not an accurate gauge for energy efficiency. The energy use on a campus is driven by many different interactive elements. The lighting, cooling, humidifying, dehumidifying, heating of domestic water, and process needs of campuses are all independent of Heating Degree Days. In fact, two of the three campuses (Brooklyn HSC and Stony Brook HSC) identified by the audit as needing more emphasis on energy conservation, experience a peak in energy use during July and August when there are no Heating Degree Days.

• Note 1

The University reduced its total energy consumption since 1973/74 from 230.9 to 155.8 thousand BTU's per OGSF, a 32% reduction. These tangible energy savings were achieved by the following:

• Note 2

1. Reduced lighting levels through delamping;
2. Conversion to more energy efficient light sources;
3. Reduced hours of operation for heating, ventilating, and air-conditioning;
4. Reduced space heating temperatures;
5. Installing computerized energy management systems;
6. Reduced fresh air intake to buildings;
7. Fostering a total commitment of staff, faculty, and students to reduce the University's energy use.

The money saved through this energy conservation effort would provide:

1. Heat and electricity for over 150,000 homes for one year;
2. The cost of utilities at SUNY Albany for 55 years;
3. The cost of utilities at State University College at Cortland for 124 years;
4. The cost of utilities at the State University College of Technology at Farmingdale for 172 years;

• See State Comptroller's Notes, Appendix C

5. The cost of utilities at the State University College at New Paltz for 180 years.
6. The cost of utilities at the State University College of Agriculture & Technology at Cobleskill for 200 years.

Overall, the University's total energy consumption per adjusted net square foot in Fiscal Year 1990/91 was down 6.3 percent compared to Fiscal Year 1989/90. The New York State Energy Office (SEO) in their State Facilities Energy Conservation Program (Executive Order No. 132) Report on 1991 Energy Plans, released on June 12, 1992, determined the University's 6.3% reduction to be the greatest reduction in energy use per square foot of all State agencies. A copy of this report has been forwarded under separate cover to the Office of the State Comptroller.

* Note 3

That same SEO Report states:.."**More than half of the 12 reporting agencies have exceeded the FY 1990/91 annual goal of 3.6 percent reduction in energy use per square foot. The most notable are SUNY (6.3%), OMH (5.2%) and OMRDD (4.1%).** The Report further states that--"**The energy use and cost data for FY 1991/92 show SUNY continuing steady progress toward the Executive Order 132 goal of a 20% energy reduction by the year 2000. SUNY's energy use per square foot has dropped 6.3% since the base year, exceeding the interim annual energy reduction goal of 3.6% (based on an average of 1.8% per year)**". Also noted in SEO's Report is the fact that **SUNY's reduction in energy consumption provided a Cost Avoidance of $5,628,517.00 in FY 1990/91 and a Cumulative Cost Avoidance of $6,790,101.00 since the 1988/89 Base Year.**

* Note 1

The University, in its Energy management and Budgeting System (EMBS) monitors and displays energy use on a square foot basis (BTU's/OGSF) and on a square foot per Heating Degree Day (BTU's/ OGSF/HDD). Both figures must be evaluated against changes in campus activity to determine effectiveness of energy conservation. As an example, the energy use in BTU's/OGSF at Stony Brook HSC indicates a modest downward trend (175,000 down to 155,565) since 1980-81 while the other measure, BTU's/OGSF/HDD, shows a slight increase (99.42 to 102.32). In reality, Stony Brook HSC energy conservation efforts have been quite successful. The BTU/OGSF (11.7% decrease) figures are particularly impressive because there were a significant number of impacting factors which together might well have caused a rise in consumption. These factors include an increase of one hundred twenty (120) hospital beds that have been added in the last five years (this is a 31.5% increase); the 143% increase in sponsored research (Stony Brook did $29,868,385 in FY 1980/81 and $72,657,751 in FY 1990/91); and the thirty-four percent increase in FTE students. These factors have all added substantially to the energy needs of the campus and have eroded what might otherwise have been greater bottom line energy savings.

In order to evaluate energy conservation performance, all of these factors must be studied.

* See State Comptroller's Notes, Appendix C

RECOMMENDATIONS

(OSC) 1. Ensure that all SUNY buildings comply with the Energy Office lighting standards.

(SU) 1. Prior to this study, OCF had directed campuses to analyze building lighting systems and file compliance statements. The results of this directive were provided to OSC while conducting this study. Buildings not in compliance will be brought into compliance by the lighting rehabilitation program described in our response to OSC's recommendation below.

The University was working with the New York Power Authority, the State Energy office, and an Energy Service Company to put together a program to address lighting before and while the Comptroller's study was in progress. These programs go beyond the study's recommendation. They provide audit, design, construction and financing of energy efficient lighting projects. Examples of these activities include:

Three SUNY campuses (Purchase, Maritime, and Brooklyn HSC) are currently in the second phase of construction with the Power authority in their High Efficiency Lighting Program.

SUNY has recently signed a Memorandum of Understanding (MOU) with the State Energy Office (SEO) to finance $3,800,000 in lighting conservation work at SUNY Binghamton and Cornell Statutory Colleges. This was the product of SEO's Demand Side Bid to New York State Electric and Gas (NYSE&G).

The New York Power Authority has begun conducting audits or is already in the design phase for lighting conservation at Albany,New Paltz, Farmingdale, Old Westbury, Geneseo, and Central Administration. NYPA is scheduled to start audits and design at six (6) additional campuses this Spring (Syracuse HSC, Brockport, Fredonia, Cortland, Oneonta and Stony Brook).

SUNY Morrisville is in construction now to modify lighting in five (5) buildings; this is being done by New York State Electric and Gas Company (NYSE&G).

Canton is participating in Niagara Mohawk's not-for-profit program, and will be modifying their lighting this Summer. niagara Mohawk is paying for design services and 35% of construction costs.

SUNY Buffalo is currently being audited by an Energy Service Company (Niagara Mohawk's Power Partner Program) and should move into design this Summer.

The remaining campuses will be scheduled with the Power Authority or other utility

programs as soon as they can be fit into an appropriate program.

(OSC) 2. Develop a system to track the recommendations made in energy audit and technical assistance study reports to ensure

* Note 4

(SU) 2. Agree; SUNY had already begun development of a tracking system and was into the implementation stage when this OSC study began. Preliminary data runs have been made available to the OSC's auditors.

(OSC) 3. Work with campuses that have consistently high energy consumption rates to develop an action plan to reduce consumption.

(SU) 3. We agree that more detailed planning is necessary at Stony Brook and Brooklyn HSC.

(OSC) 4. Ensure energy improvement funds are directed to cost-effective projects at campuses that have problems with energy efficiency.

(SU) 4. The University has always directed energy conservation funds to the most cost-effective projects based on the requests.

(OSC) 5. Determine the feasibility of upgrading energy management systems at the campuses, and where feasible, do so.

(SU) 5. Capital funds have not been available for Energy Management Systems (EMS) upgrades. Therefore, campuses have been and will continue to be encouraged to use operating funds to install and expand Energy Management Systems.

(OSC) 6. Develop a schedule to ensure all required energy audits and technical assistance studies are completed by the end of 1994.

(SU) 6. There is currently no money available to conduct energy audits or Technical Assistance studies as envisioned by Executive Order 132. The University is taking advantage of free audits being provided by utility companies. Data on projects is being compiled from these audits.

Technical Assistance (TA) studies include detailed and costly engineering analysis; the studies do not directly produce cost savings. Fifty to one hundred percent of the cost of conducting TA studies must come out of campus operating funds. There is simply not enough funding to meet existing operating needs.

(OSC) 7. Require the schools to establish short and long-term plans and measurable goals for reducing energy consumption.

* See State Comptroller's Notes, Appendix C

(SU) 7. SUNY campuses have and continue to address no-cost and low-cost energy conservation measures and have made measurable progress as confirmed by the New York State Energy Office in their State Facilities Energy Conservation Program Report on 1991 Energy Plans (June 12, 1992). The lighting and electrical measures being implemented by the New York Power Authority (NYPA) or Utility Demand Site Management (DSM) programs are about all they will be able to achieve without large amounts of Capital. The University Capital Budget (bond funds) are already over solicited.

Campus Comments

State University of New York at Binghamton

Lighting Standards

Since the late 1970's, Binghamton University has pursued a vigorous program of energy conservation and energy reduction which continues to date. In 1985, we embarked on a program to meet or exceed the 1980 mandated light level reductions and reduce the size of heating and ventilating fan motors. All of Binghamton's Campus buildings are in compliance with the lighting standards except the Central Heating Plant.

Energy Saving Recommendations

The Campus continues to take advantage of the local utility company audits by implementing their recommendations. In 1989, this Campus installed variable speed motor controllers on large pumps on campus, resulting in the rebate of $192,764 from our local utility. This award winning pilot program has been recognized both statewide and nationally. Currently, we are in the process of implementing a State Energy Office/New York State Electric & Gas $1.753 million Demand-Side Management Project which is scheduled for completion in December 1994. Through the installation of compact fluorescent fixtures, high efficiency T-8 fluorescent lighting, and additional variable speed motor controllers, it is estimated this project will cut 520 kilowatts from the Campus peak winter power consumption.

Upgrade of Energy Management Systems

In the mid 1970's, the Campus installed a Johnson Control Energy Management System. In 1985, the system was upgraded. This year, a $500,000 grant from the State Energy Office is making it possible for us to upgrade the system to state-of-the-art technology to allow finer control of energy consuming systems in each building on Campus.

The coal fired Central Heating Plan was converted to a coal/gas fired system in 1989. This system is currently being upgraded to make it more efficient. The project includes

the installation of a one kilowatt emergency generator which may also be used to curtail campus peak electrical demand.

In January 1992, the Facilities Office established a standard for high efficiency fluorescent lighting for all project designs on campus. This standard utilizes T-8 tubes, high-efficiency ballasts, and specular reflectors in all campus-installed lighting, further reducing electrical consumption, while improving lighting levels. Another energy reduction standard that has been established at this campus is the conversion of street and parking lighting to high pressure sodium lamps to reduce the unit wattage from 400 to 150 watts per unit.

Planning

In 1990, the campus Administration, in concert with the Physical Plant, implemented a 13 day Christmas vacation shutdown that has become an annual energy saving program. The Binghamton Campus is a proven leader in implementing energy conservation programs and planning for the future. For instance, there is a project in the design stage to convert our existing high temperature hot water system to a low temperature system for safer and more efficient operation. Additionally, the Campus is working closely with the State University Construction Fund in researching the possibility of utilizing the excess heat from the Central Heating Plant to co-generate power to meet some or all of the Campus' electrical demand.

Over the last twenty years, Binghamton University has pursued, and will continue to pursue, energy conservation programs and employ new energy reduction techniques in an aggressive manner. Since 1980, our outside gross square footage (OGS) has risen from 3,321,993 to 4,0505,148 while our energy consumption has been reduced from 22.18 BTU per OGS to 20.90 BTU.

State University of New York at Stony Brook

The study provides a review of complicated systems during a period of constricting resources. While consumption rates have grown during the period under review, so has the campus and so has electronic technology and its practical application. The use of personal computers, CT scanners, linear accelerators, magnetic resonance imaging and advanced diagnostic equipment both in the hospital and by researchers have clearly increased consumption.

University Hospital at Stony Brook began operations in 1980 and has dramatically increased the availability of care to the residents of Long Island. It has a 540 bed capacity, nearly half dedicated to intensive and specialty care which are heavily dependent upon electrical energy.

Specific comments and observations are as follows:

The observation (on page 4) that none of the buildings at this Center complied with lighting standards is misleading. We provided the auditors with status reports on the significant progress made in the implementation of the lighting standards. The observation as written implies no attempt at compliance, which is not the case. In the same vein, OSC's calculation of the estimated cost of non-compliance is seriously flawed.

• Note 5

Also on page 5, OSC makes an observation about setting of thermostats as if complex commercial temperature control systems are as easy to control as a home thermostat. This, of course, is not the case. Temperatures in most buildings are controlled by various highly complex mechanical and electronic devices which regulate the mixing of heated or chilled water which is then circulated through heat exchangers. Most of these control devices were installed with minimal concern for energy costs and provide little opportunity for simple adjustment.

There is no such thing as a cost free energy savings opportunity. Someone must perform some activity to implement energy conservation programs and labor costs money. There were serious reductions in maintenance and operations staffing during these years and other tasks took priority, such as stopping leaks, addressing hazardous conditions and other day to day operations. On page 5, OSC makes an observation that another $2.9 million annual savings could be achieved with the expenditure of $3.8 million. Where was this $3.8 million to come from? How can OSC state that a $3.8 million expenditure to save $2.9 million annually equates to a payback period of less than one year? In actuality, there was no provision of funding to this Center to cover this one-time investment.

• Note 6

The report's observation relative to higher energy consumption rates (page 8) makes no mention of the increase in highly energy dependent state-of-the-art equipment added over the period. Without an in-depth analysis of the increase in energy consuming equipment over this period, there isn't an adequate basis to draw a conclusion.

Energy management and conservation continue to be high priorities at this Center. The OSC auditors were provided with ample documentation of the many projects completed and under way to control and reduce energy consumption where possible.

Health Science Center at Brooklyn

The study cites that "the consumption rates at the Stony Brook and Brooklyn Health Science Center were two to three times as high as the consumption rate at SUNY's other Health Science Center at Syracuse". The study fails to acknowledge differences in the heat delivery systems utilized by Syracuse and Brooklyn. The HSC-Syracuse purchases steam directly rather than purchasing natural gas or fuel oil which in turn is converted to steam. By purchasing steam directly there is no loss due to conversion of gas to steam and boiler and stack losses. On the other hand, HSC-Brooklyn must purchase the natural gas and fuel oil and convert to steam in-house. This process, and losses inherent with

an in-house boiler system, have not been factored into the analysis. This should be fully explained in the study. The utility company that delivers natural gas to the HSC-Brooklyn does not deliver steam directly.

The study indicates that Stony Brook West, Stony Brook Health Science Center and the Brooklyn Health Science Center accounted for over 27 percent of SUNY's total energy expenditures for the year ended March 31, 1990. This statistic does not take into account that the two Health Science Centers are 24-hour, seven-day a week operations providing patient care. To compare them to educational facilities where there is no need to provide continuous power for patient care and medical research is inappropriate.

• Note 7

An additional flaw in the comparison is that the measuring unit, which is in BTU's/OGSF/HDD, is biased. It bases the measure of energy consumption on heating degree days, but not on cooling degree days. The Brooklyn campus is located in metropolitan New York City, an overdeveloped urban locale with summer cooling needs exceeding those of more rural areas with more vegetation. New York City, like Stony Brook, is at a more southerly latitude than Syracuse. Although the heating needs associated with Syracuse's latitude are factored in, the cooling needs associated with the latitude of Brooklyn and Stony Brook are not. The net effect of not allowing for the difference in latitude and the urban location is to penalize Brooklyn for the cooling needs associated with its location. Therefore, cooling degree days should be factored into the comparison.

• Note 8

The study also fails to mention some of the programs and initiatives taken to reduce energy consumption and costs at HSC-Brooklyn. These include: renovation and upgrading of aging power plant HVAC equipment, purchase of fossil fuel at reduced rates through transportation gas and various local initiatives and boiler upgrades.

A relevant statistic that is not reflected in the study is that in the past three fiscal years there has been a decrease in total energy consumption at HSCB. A comparison between fiscal year 1989-88 and fiscal year 1990-91 shows a 9.6% overall decrease in total energy consumption.

In addition, the HSC-Brooklyn is continually attempting to reduce energy consumption and costs through new studies and programs. These include participation in the High Efficiency Lighting Program and the initiation of cost benefit studies to be performed by energy contractor/consultants.

<u>State University College at Geneseo</u>

We find the Comptroller's study seriously flawed in both its methodology, calculations and conclusions. Our concerns are as follows:

1. Comparing a ten year average energy consumption is <u>not</u> indicative of consumption trends or conservation progress. Averages do not account for systems and equipment

• See State Comptroller's Notes, Appendix C

problems in some years like underground steam leaks, nor do they adjust for new buildings brought on line. At Geneseo a true comparison of consumption in 1980-81, 23.45 BTU/OGSF/HDD, compared with 1989-90, 17.93 BTU/OGSF/HDD, shows a -real- reduction of 23.54 percent.

2. Funding of energy conservation projects has not been a high priority of State government. Projects with more than a three year payback have been rejected. Most "quick fix", inexpensive work has been done already around the University. It will now take a huge capital investment to alter systems and equipment to achieve additional substantial savings.

3. Increased facility use was not factored into the Comptroller's calculations. As colleges increase community service and conferences as part of their public service missions, energy consumption increases. Also, the University's Graduate Research initiative has successfully increased research on campuses substantially. This, too, leads to a commensurate increase in energy consumption. I do not believe that the University should abandon important parts of its mission in order to satisfy the Comptroller's desire for reduced energy consumption. • Note 9

4. While the College attempts to meet energy setpoints and lighting level standards, nearly all our buildings are old and contain antiquated building systems, making it impossible to provide consistent temperatures throughout a building. We heat to maintain the coldest part of a building at the energy setpoints. Other sections of the building may well significantly exceed the standards. To correct this problem would require a substantial capital outlay for new building systems and at least window replacements. Such projects have not been approved either because the payback is too long, or because of problems with the State Office of Historic Preservation.

5. SUNY's progress, not its ten year average, should be benchmarked against other State agencies and other colleges in the state to reveal a true picture of its success.

6. There is a logical tautology in the Comptroller's conclusion that Geneseo has received too much energy conservation money because its consumption is so low. The draft report does not consider that the consumption may be low just because the money was spent. • Note 10

State University College at Old Westbury

During the audit staff's visit to this Campus, Old Westbury Facilities staff went to considerable length to document the energy efficiency upgrades that had taken place on campus over the last five years. These included upgrading lighting to more energy efficient types; installing occupancy sensors in classrooms; installing window tint on large southern exposed windows to significantly reduce air conditioning loads, and upgrading air conditioners with units having high EER ratings, just to mention a few. None of these

projects to upgrade energy efficiency were included in the report.

There was also no mention of the State University Construction Fund's effort to foster energy savings by increasing the R values and decreasing U values for respective roof and window projects wherever opportunities to do so presented themselves; or about projects designed to increase the efficiency of oil or natural gas burning equipment.

Old Westbury, as well as other campuses, has instituted a two week shutdown during the Christmas vacation specifically to save money by reducing energy use. This is not mentioned in the report.

In conclusion, it seems that the report totally neglected the many attempts by the individual campuses and by the State University Construction Fund to incorporate energy conservation into their day to day operations.

State University College of Oswego

Lighting Standards

Oswego has ongoing lighting studies with Niagara Mohawk as well as a promised audit by New York Power Authority. As the utilities make recommendations they are implemented.

Energy Consumption Rates

When lighting audits have been completed, we will be in a position to formalize our long term action plan.

Energy Management System

Our "EMS" works well and we will continue to expand it efficiency as funds are available.

Planning

Oswego long ago made giant strides in electric efficiency. Our only hope now for improvement lies in our ability to acquire funds perhaps through NiMo incentives to purchase more energy efficient, state of the art motors. Also expanding our EMS will no doubt help in this effort, but again only possible with appropriate funding assistance.

State University College at Potsdam

The State's commitment to achieve energy cost reductions should be just that, energy cost reductions. The State needs to take an active role in utility rate cases, intervening when necessary to ensure that rates are not increased unreasonably. The State must

take a proactive role in dealing with energy rate cases, not a reactive role by expending huge sums of money on energy improvements, only to see them diminished by unrealistic rate increases.

The recommendation to develop a system to track the recommendations made in energy audits and technical study reports does not go far enough in determining why energy savings recommendations were not implemented.

The problem that should be addressed is in not developing a system to track projects but possibly to separate energy savings projects out from the capital monies available for all projects. Energy savings projects are grouped with all other campus requests for scarce capital dollars. When set in a priority stage, the energy savings project typically take a backseat to roofing, asbestos abatement, fire and life safety and durability enhancement projects.

The blame cannot be set on anyone in particular, given the option, the campuses will always choose preservation of capital facilities and compliance with the law over an energy savings related projects. A recommendation would be to separate some funds from the capital projects monies and earmark them specifically for energy savings projects and develop criteria at Facilities Management for allocation of funds based on energy savings realized.

We disagree that campuses that do a better than average job in reducing energy consumption be denied funds to further improve their campus operation. The campuses that have expended funds in the energy savings area and are showing results are demonstrating that the program works and should be a testimony to the other campuses. Penalizing them is not the type of reinforcement that they require to maintain or improve upon their positive results.

• Note 11

College of Agriculture and Technology at Cobleskill

The SUNY Cobleskill Campus has routinely committed itself to reduce its utility expenses. Initiatives have covered such issues as relamping, ballast replacement, and temperature control replacement to name a few. Much of what remains to be accomplished will require the commitment of capital resources as the issues relate to structures and systems.

The College has participated in our utility vendor rebate programs whenever possible. Problematically, the upfront funding required to purchase the energy saving devices is very difficult. Finding ways to work within accounting regulations, as well as having accessible cash flow can be difficult if not impossible in some situations.

The study, however, fails to take into consideration the quality and condition of capital facilities that have routinely been denied upgrading due to budgetary constraints. This

situation became even worse as funding that could have been used for energy issues were directed to deal with asbestos- and PCB-related expenses.

The technological advances which have occurred during the period analyzed have been significant. It is, therefore, interesting to note that while the cost of energy is recognized, the study appears to make no allowance for the adaptation of all the added equipment and new buildings that have been added to our system.

State Comptroller's Notes to SUNY Response

1. SUNY officials take exception to our methodology for measuring program success. We believe that our approach, which included analyzing campus compliance with the State Energy Office's lighting standards, the extent of action taken by the campuses to implement cost saving recommendations in energy audit and technical assistance study reports and the relative energy consumption among the campuses for an extended period of time gives valid indications of the extent of success of SUNY's energy conservation program. As a point of interest, SUNY uses the same methodology we used in our study when it prepares budget forecasts of energy costs and provides comparative information to the campuses on energy consumption.

2. SUNY compares its current energy consumption to that of the early 1970s to demonstrate its success in energy conservation. We agree that since the early 1970s SUNY's energy consumption has been reduced, however that fact does not mitigate the findings of our study that much more energy efficiency was available to SUNY had its program been better managed.

3. The State Energy Office Report is based on information as reported by the various State agencies. Nonetheless, it is noteworthy that such reported data indicates that SUNY is making good progress in meeting energy conservation goals. It is equally noteworthy, however, that our study report indicates that SUNY has been slow to meet lighting standards set by the State Energy Office costing the State an estimated $1.7 million annually in unnecessary electrical costs. We also point out that several millions of dollars of energy costs could be saved annually if SUNY implemented the low-cost and no-cost recommendations contained in reports of energy audits conducted by utility companies.

4. These comments by SUNY officials are not accurate. When we started our study, SUNY officials were requested to but could not provide us with copies of the energy audit and technical study reports because the campuses were not required to submit them to SUNY. Such reports are essential to implement the recommended tracking system.

5. We did not imply that Stony Brook has made no efforts to comply with the lighting standards. Instead, we stated that, as reported by Stony Brook itself, none of its buildings complied with the standards.

6. Stony Brook officials misstated our comments related to the payback period. In essence we said that $1.1 million of savings related to no-cost improvements and $2.9 million of savings related to low-cost improvements for a total savings of $4 million which when compared to the total cost of the improvements ($3.8 million) yields a payback period of less than one year.

7. SUNY officials' contention that the health science centers consume more energy than educational facilities because the centers have 24 hour a day operations does not explain why, as our report points out, that the Stony Brook and Brooklyn Health Science Centers had energy consumption rates that were 2 to 3 times as high as SUNY's other health science center at Syracuse.

8. We discussed the cooling degree day factor with SUNY officials during the study. They advised that the necessary data would be difficult to obtain and that it would not necessarily have any significant impact on consumption rates. Accordingly, we did not include the factor in our analyses.

9. We do not understand the basis for this comment by Geneseo officials. The report does not imply that SUNY should curtail important functions for the sole purpose of generating energy savings.

10. We agree with the implication in Geneseo officials' comments that relatively low energy consumption rates could result from the expenditure of energy improvement funds. This is, in part, why we recommended that energy improvement dollars be directed to campuses that have problems with energy efficiency.

11. Our report does not recommend that certain campuses be denied energy improvement funds to improve their campus operations. Rather, we are pointing out that some SUNY campuses with high energy consumption rates have received relatively little energy improvement funding.